9

ALLANETES, A NEW LOWER DEVONIAN CHONETID BRACHIOPOD GENUS

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Abstract

Allanetes is proposed for a relatively large chonetid with a fold on the pedicle valve. It is based on *Allanetes neozelanica* sp. nov. from the Reefton beds (Emsian) of New Zealand. *Allanetes* is almost restricted to the Reefton brachiopod fauna, but probably is present in southeastern Australia if *Chonetes? foedus* Talent 1963 proves to belong. The new genus may be most closely related to the chonostrophiids, considering the nature of the chilidial structures, but family assignment is uncertain.

Introduction

The brachiopod fauna of the Reefton beds of New Zealand (Allan 1935, 1947) includes many large brachiopods that are generally well preserved as internal and external moulds. The assemblage is such a distinct one and comprises so many endemic or rare forms that it has been of particular interest over the years to students of Lower Devonian brachiopods. Among the particularly diagnostic elements are *Tanerhynchia* (a rhynchonellid), *Maoristrophia* (a strophomenacean), *Reeftonia* (a dalmanellid), *Reeftonella* (a smooth terebratuloid), and the large ribbed terebratuloid *Pleurothyrella venusta.* So far none of the provincial Reefton elements mentioned above has been found in North America or Europe. However, *Tanerhynchia* is known in the Lower Devonian Horlick Formation of Antarctica (Boucot, Johnson, and Doumani 1965). *Reeftonia* is known only from New Zealand and from Australia where it is represented by *Cariniferella alpha* Gill (Johnson and Talent 1967). *Reeftonella*, the smooth terebratuloid, is still unknown outside of New Zealand, and *Maoristrophia* occurs outside of New Zealand in Victoria, Tasmania, and Kazakhstan (Gill, Boucot, and Johnson 1966). *Pleurothyrella*, represented by *P. venusta*, appears to be an endemic form and is distinguished from other *Pleurothyrella* species by its bifurcating ribs (Boucot, Caster, Ives, and Talent 1963). The presently known occurrences of *Pleurothyrella* with simple ribs are in the Malvinokaffric Province, including southern South America, the southern tip of South Africa, and the Antarctic (Boucot, Johnson, and Doumani 1965.)

In addition to the endemic and provincial forms, there are a few more-common brachiopod genera including a transverse acrospiriferoid of the *A. hercyniae* type (*Acrospirifer coxi* Allan 1947), which is widespread on a worldwide basis during early Emsian time and which serves in large part as the basis for a lower Emsian assignment of the Reefton beds yielding the new genus *Allanetes*. In view of the occurrence of the Reefton genera *Maoristrophia* and *Reeftonia* in Victoria and the probable occurrence there of *Allanetes*, represented by '*Chonetes*' *foedus* Talent, the Reefton brachiopod fauna may be accurately characterized as partly endemic and partly transitional between the Emsian fauna of the Malvinokaffric Province and that of Victoria, south-eastern Australia.

The availability of considerable new fossiliferous material obtained by Boucot with the kind assistance of Professor Robin Allan during the austral summer of 1964-65 provided many specimens of the new chonetid genus *Allanetes*, proposed in this paper.

Systematic Palaeontology

Superfamily CHONETACEA Bronn 1862

[*nom. transl.* Shrock and Twenhofel 1953 (*ex* Chonetidae Bronn 1862)]

FAMILY UNCERTAIN

Genus **Allanetes** gen. nov.

TYPE SPECIES: *A. neozelanica* Boucot and Johnson sp. nov.

DIAGNOSIS: Large concavo-convex chonetids with ventral fold and an ornament of coarse, rounded, bifurcating costae; ventral median septum high, blade-like; chilidial plates broadly disjunct.

SPECIES QUESTIONABLY ASSIGNED: *Chonetes? foedus* Talent (1963, p. 68, Pl. 37B, 38A). This species has the style of ribbing of *Allanetes* rather than *Parachonetes* and is sulcate, 'with pronounced differentiation between the main body of the shell and the weakly ornamented postero-lateral slopes' (Talent 1963, p. 68). The nature of the chilidial plates is not known.

Allanetes neozelanica sp. nov.

(Pl. 22, fig. 1-19)

MATERIAL: Specimens from USNM loc. 11000, Reefton beds, Reefton Subdivision, sheet S-38, 373, 23-2, Inangahua River section, 3½ miles southeast of Reefton on north side of Highway 7, South Island, New Zealand. 11000D, shales with *Allanetes*. 11000E, Creek bed argillites with *Allanetes, Maurispirifer*, and *Reeftonella*, etc. Collected by A. J. Boucot, 1965.

USNM loc. 11727, Reefton beds, lower band of argillite in creek bed. From the lowest observed fossiliferous band of the argillite which immediately underlies the main limestone; fossils from a small creek bed just off the side of the road, Reefton Subdivision, South Island, New Zealand. Collected by David Ives, loc. RS-001-RS013, 1963.

The illustrated specimens are deposited in the University of Canterbury Museum, Christchurch, New Zealand.

EXTERNAL FORM: The valves commonly reach a relatively large size for Siluro-Devonian chonetids and generally are a little wider than long. The largest specimens usually attain a maximum dimension of 25-30 mm along the hinge line. Accurate measurements of the original shell dimensions are not obtainable because of distortion and inadequate preservation. In lateral profile they are moderately concavo-convex delimiting a small body cavity. The hinge line is long and straight, but generally less than the maximum width of the valves slightly posterior to midlength. The cardinal angles are obtuse and evenly rounded, no development of mucronation being seen on any of the available specimens. Medially on the pedicle valve there is a broad rounded fold that may become pronounced anteriorly and there is a corresponding broad, shallow sulcus medially in the brachial valve.

EXTERNAL ORNAMENT: The external ornament consists of relatively strong rounded radial costae that increase in number anteriorly by bifurcation on the pedicle valve and by intercalation on the brachial valve. The costae are separated by deep rounded interspaces of approximately the same width as adjoining costae. The costae that reach the posterior margin of the valve emanate from the beak and none originate along the hinge line. 10 mm anterior to the hinge line, there are commonly 5 or 6 costae in the medial region of brachial valves in a space of 5 mm.

POSTERIOR STRUCTURES: A few spine bases are preserved along the hinge line of the pedicle valve and they prove to be fairly prominent small conical projections. Commonly there are two or three spine bases on each side of the hinge line. The interarea of the pedicle valve is well developed, flat, subtriangular, and orthocline. The delthyrium is covered apically by a posteriorly convex pseudodeltidium with a slightly concave dorsal edge. The interarea of the brachial valve is long, low, flat, and steeply anacline or hypercline. The chilidial plates are completely disjunct, discrete plates lying lateral to the base of the cardinal process lobes medial to the sockets, and connecting with the posterior faces of the inner socket ridges.

INTERIOR OF PEDICLE VALVE. The hinge teeth are sub-semicircular lobes projecting anteriorly from the edge of the interarea. Internally the teeth are thickened by divergent rounded ridges that lie beneath the interarea, but the teeth are not connected with the base of the valve by dental lamellae. Posteriorly there is a short but very high, plate-like median septum that extends anteriorly approximately to the middle of the adductor muscle scars. The adductor muscle scars form an elongate pyriform impression that is very faintly defined and may be bounded posterolaterally by broad, low, muscle bounding ridges. The diductor impression is broad and fan-shaped, anteriorly flabellate, but poorly impressed everywhere except along its posterolateral extremities. The remainder of the interior, lateral and anterior to the muscle impressions, is papillose.

INTERIOR OF BRACHIAL VALVE: The cardinalia consist of a pair of cardinal process lobes, chilidial plates, and inner socket ridges. The chilidial plates, being broadly discrete and situated away from the apex of the notothyrium, are essentially interior structures, but are described above. The outer socket ridges are faint and consist essentially of slight internal projections of the edge of the interarea. The inner socket ridges are strong, broadly divergent, rounded ridges that support a pair of cardinal process lobes medially. There is a broad, shallow pit or alveolus on small specimens, adjacent to the medial junction of the inner socket ridges. The cardinal process lobes are a pair of short plates that face more or less posteriorly on small specimens, meeting dorsomedially, but diverging slightly toward the pedicle valve so as to have an external appearance of an inverted V when viewed from the posterior. In large specimens the chilidial plates are vestigial, the cardinal process lobes become more clearly a pair of distinct plates, and the whole notothyrial area is thickened, forming a triangular platform at the expense of the broad alveolus present in very small specimens. There is a short divergent pair of anderidia and a long, low median septum that originates slightly anterior to the notothyrial platform. The cardinal process lobes project posteroventrally. The interior is pustulose except in the area of the muscle impressions.

RELATIONS: Externally the size, convexity, and the coarse bifurcating costae give *Allanetes* some resemblance to *Parachonetes*, recently proposed by Johnson (1966, p. 365). However, *Parachonetes* does not develop a ventral fold. In addition, lateral ribs of *Parachonetes* originate along the hinge line while in *Allanetes* they originate medially and parallel the hinge line. Internally, *Allanetes* differs even more strongly from *Parachonetes*. The new genus lacks the well developed alveolus of *Parachonetes*, but instead has a pair of pillar-like cardinal process lobes erected on an elevated triangular platform. The chilidial plates of *Parachonetes* appear to be very small and apically situated while the chilidial plates of *Allanetes* are broadly disjunct and essentially internally situated. *Allanetes* differs from *Eccentricosta* Berdan (1963) on most of the points discussed above for *Parachonetes*. In addition, *Eccentricosta* has the split ventral septum commonly seen in *Protochonetes*.

The older genera *Protochonetes* and *Strophochonetes* are both small, generally more nearly flat, and have much finer ribs. Internally, neither *Protochonetes* nor *Strophochonetes* has cardinalia that suggest any close relation to *Allanetes*. *Chonetes*, as strictly interpreted (see Muir-Wood 1962, p. 35-40), is commonly flatter, has finer costae, and lacks external trilobation. Internally, *Chonetes* bears different cardinalia, lacks the widely disjunct chilidial plates of *Allanetes*, and bears accessory septa-structures that are not developed in *Allanetes*.

Allanetes, in some respects at least, can be compared with the chonostrophiids —*Chonostrophia*, *Chonostrophiella* Boucot and Amsden (1964), and *Notiochonetes* Muir-Wood (1962). All of these have the unusual broadly disjunct chilidial plates situated lateral to pillar-like cardinal process lobes. The shape and external ornament of the three chonostrophiid genera, however, is very different from that seen in *Allanetes*. The chonostrophiids are typically nearly planar shells with *Chonostrophia* and *Chonostrophiella* being faintly convexo-concave compared to *Notiochonetes* which is gently concavo-convex. The external radial ornament of all three is very fine, thus the considerable differences in shape and external ornament suggest something less than close association between them and *Allanetes*, and for this reason the ancestor of *Allanetes* must be regarded as uncertain.

Acknowledgements

The writers are indebted to Professor Robin Allan, University of Canterbury, Christchurch, New Zealand for taking Boucot to the collecting site of *Allanetes* during the austral summer of 1964-65. The writers' work in Pasadena has been done under a grant from the National Science Foundation, No. GP-3743. We designate the new chonetid genus *Allanetes* in recognition of Professor Allan's almost singlehanded efforts over a period of more than thirty years to make known the Early Devonian fossils of the Reefton area.

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Explanation of Plate 22

Figs. 1-19.—*Allanetes neozelanica* gen. et sp. nov. Reefton beds (Lower Emsian) Sheet S-38, 373, 23-3, Inangahua River section, 3½ miles SE of Reefton on north side of highway 7, Reefton Subdivision, New Zealand. USNM Locality 11000. Collector A. J. Boucot, 1965. Figs. 1-8, 10-19 loc. 11000D. fig. 9, loc. 11000E. 1-3. Internal mould of brachial valve and rubber impression × 2, and rubber impression × 4, UCM 451; 4, 5. Rubber impression and internal mould of brachial valve × 2, UCM 452; 6-8. Posterior and interior views of rubber impression × 10 and internal mould × 5, UCM 458; 9. Rubber impression of external mould of pedicle valve × 2, impression of UCM 454; 10. Rubber impression of external mould of brachial valve and interarea of pedicle valve × 2, UCM 455; 11, 12. Rubber impression of internal mould of pedicle valve and posterior view of internal mould × 1·5, UCM 456; 13. Posterior view of internal mould of pedicle valve × 2, UCM 457; 14. Oblique view of rubber replica of ventral interior, × 4, impression of UCM 457; 15, 16. Posterior view of external mould of brachial valve and dorsal view of rubber impression × 2, UCM 453, counterpart of specimen in fig. 5; 17-19. Interior view × 5 and × 2 of rubber impression and internal mould of pedicle valve × 2, UCM 459.